Patent claims

1. A method for the production of carbon black or other flame aerosols,

characterized by the following steps:

a) removal of the heat from the flame by thermal conduction and/or radiation, the heat being released at a solid, cold surface or a liquid surface,

f) formation of a thin gas boundary layer, for example of air, between the flame and the cooling surface, in order to prevent the accumulation of aerosol particles on the surface,

g) acceleration or expansion of the flow formed by the flame and the boundary layer, in order to keep the flow laminar and to achieve as thin a boundary layer as possible,

h) withdrawal of the aerosol formed from the vicinity of the cold surface and

i) cleaning of the cooling surface.

2. The method as claimed in claim 1, characterized in that the boundary layer is produced by feeding a gas stream between the flame and the cooling surface.

3. The method as claimed in claim 1 or 2, characterized in that the boundary layer is guided into the region of

the flame by means of a movement of the cooling surface.

4. The method as claimed in any of claims 1 to 3, characterized in that the boundary layer is introduced between the flame and the cooling surface by means of a deflector plate.

5. The method as claimed in any of claims 1 to 3, characterized in that the boundary layer is produced by a flow of a gas or vapor through the cooling surface having openings or pores.

6. The method as claimed in any of claims 1 to 3, characterized in that the boundary layer is produced by the vaporization of a liquid on the cooling surface.

7. The method as claimed in any of claims 1 to 6, characterized in that the flame is guided between two cooling surfaces having two boundary layers.

8. The method as claimed in any of claims 1 to 7, characterized in that the flame is cooled in a convergent gap or convergent channel having cooling surfaces and having boundary layers.

9. The method as claimed in any of claims 1 to 8, characterized in that the flame is cooled in a convergent gap between two rotating rolls having cooling surfaces and having boundary layers.

10. The method as claimed in any of claims 1 to 9, characterized in that the aerosol-containing flow layer

is removed from the cooling surface by means of a nozzle through which gas flows.

11. The method or device as claimed in any of claims 7 to 10, characterized in that the flow velocity at the narrowest point of the convergent gap is chosen to be substantially higher than the exit velocity of the flame from the burner.

12. The method as claimed in any of claims 7 to 11, characterized in that the flow velocity at the narrowest point of the convergent gap is measured and regulated by means of the pressure difference present at the gap.

13. The method as claimed in any of claims 7 to 12, characterized in that the cooling surface is a metal surface which is cooled from the back by water.

14. A device for carrying out the method as claimed in any of claims 1 to 13, characterized by a flame generation setup and a cooling surface against which the flame produced can be directed, and setups for producing a gaseous boundary layer between surface and flame.

15. The device as claimed in claim 14, characterized in that a deflector plate is arranged between the flame and the cooling surface.

16. The device as claimed in claim 14 or 15, characterized in that the cooling surface has openings or pores through which cooling gas can pass.

17. The device as claimed in any of the preceding claims, characterized in that the cooling surface is formed by two rotating rolls.

18. The device as claimed in any of the preceding claims, characterized in that the cooling surfaces of the convergent gas consist in each case of a revolving belt which is guided over a roll in the region of the gap and which moreover passes through a liquid bath for cleaning and cooling.

19. The device as claimed in claim 18, characterized in that the belt is porous, for example consisting of a textile, and is impregnated with a liquid.

20. The device as claimed in any of the preceding claims, characterized in that the gap width at the narrowest point of the convergent gap can be adjusted in the range from 0.5 to 10 mm.

21. The device as claimed in any of the preceding claims, characterized in that the distance between the base of the flame and the cooling surface can be adjusted.

22. The device as claimed in any of the preceding claims, characterized in that the distance between the base of the flame and the narrowest point of the convergent gap can be adjusted.

23. An unclassified, untreated carbon black, characterized in that the pH is less than or equal to 6.0, the residue on ignition is less than or equal to 0.1% and

the 5 µm sieve residue is less than or equal to 200 ppm.

24. The use of the carbon black as claimed in claim 23 in rubber, plastic, printing inks, inks, inkjet inks, toners, finishes, paints, paper, bitumen, concrete and other construction materials.